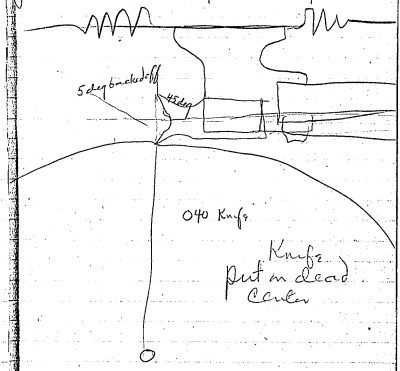
Notebook, N-03-08-24

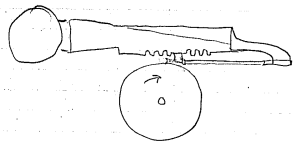
This notebook covers the period August-October 1903. All entries are by Edison. The book contains notes and drawings regarding phonograph recording apparatus and the composition of phonograph cylinders. Many of the entries pertain to tests of the arrangement, composition, and size of funnels used to concentrate sound for musical recordings. The front cover is labeled "Phonograph Aug-Sept 1903." The pages are unnumbered. Approximately 70 pages have been used.

Aug 24 1903

Phono Recorders & Cylinders chip material



Aug 24 1903 –



Plane – 6ft 9" from funnel – 75 deg Fahr –

AR jumps out scratches too much to track deeper – quickly good but not with a little explosive – no chipping surface rough –

BR Albatross as AR but cant track so deep get some scratch jumps out on some notes, surface Rough

25th E = jumps out, scratches a little, chipped in deep dado, not good at this temp –

Reg White good – Even, scarcely any scratch, only one or 2 halt jumps – Considerably deeper without increase scratch surface fairly smooth no chipping

BR jumps, scratches, chips,

Small yellow Unknown – Smooth Cut brick deep qual good, cracklies no chip

15 R
19 or 14 R Rough jumps chips

Aug 24 1903

17 R - Smooth, but cut is not polished - Seems to be uneven Cylinder too small of bigger one

13 R Phenomenon - Can't do anything with it - Can't crack it - Seems to give regards as if knife all notched up it has done this several times - S NG - Its due to not being able to turn it off smooth lots deep scratches possibly full of dirt -

40 R jumps chips - not very great scratch

34 R - a little scratch jumps out considerable on fine cutting rough - Don't chip. -

Aug 24 1903 —

49. Scarcely any scratch
Can't track quite deep — pretty
good stuff on 28 ball Even
on 35 Rag 1 R seems to blast
but not on 28 Ball 2 R —

50 R — Scratches cuts white
all chipped everywhere —

62 R Scarcely any scratch
Can't track deeper — quality
good — Even — smooth track
no chip. —

45 R Jumped out, rough surface
scratches — Can't track
any deeper

Aug 24 1903 –

44R – Its tracked deeper no jump – Scratches too much no chip quite good

36R Chipped – not very much scratch – jumped out. ~~[illegible]~~ Cuts fairly smooth,

32R = Scratches some tracked very light jumped out,

43R – Scratch very fewest fine – quitting good – jumped out on 2 notes slightly – Can track much deeper & think – Shaving tool turns it very polished – good [illegible]

Aug 24 1903

39R - Jumped - scratches, Chipped -

42R - Tracked deep very little Scratch, seems ~~[illegible]~~ not jumped -

37R = Jumped - ~~[illegible]~~ a little scratch not tracked deep - well not slow tracking deeper -

52R = Crackles terrible full holes etc - Cant test,

51R - Jumped - Chipped Scratch -

Aug 24 1903

38R = Jumped, chipped, scratch

54R Scarcely has a scratch
quite good - Thick knife
Chipped but may be a piece
dent — This is good
Cylinder etc broken
deep not chipped - not jumped,
Not extra bored -

55R Scratches some, (broken)
deep no chip no jump
harder than 54 -
Knife not chipped,

56 = Scratchy - few deep
dots chipped out -

Aug 19 1903

33R little scratchy - rough
quality - not jumped -
unnatural, —

59R all jumped out,
Scratched, chipped —

58R - ditto —

Loud - jumped badly
54R - yet not bad - scratches not
very much - This may
be ok at higher temps —

Tracked very deep very
53R little scratch - pretty good
for depth - smooth but no
Chip - Qual pretty good

Aug 19 1903

48R = Scratches very little
Crackles - quite fair -
Very rough horrible surface
about value as lamp black -
Crackles due to dust -
its probably soft material

47R - ditto still softer -

~~44~~ Piano 10 ft away

44 = Next time, moonlight weaker, music
shows up considerable scratching
Bass seems unnatural - sweet tone
on a high note. This cylinder
worn off also too much scratch ~~not~~
bracket ~~only~~ fallingupon than normal + goes down across -

Aug 24

43 - is about same as Reg white
both on 43 & Later there is 2 or 3
places where it blanks & yet no
~~blanks~~ jump out seen in there
may be due to Reproducer - I notice
swell & quality better on reproducer
has more sensitive disc also more
mellow & real as sharp - a great
amount of sharpness is accidentally
due to mechanical sharpness on
Reproducers. 1/R Reg
Corrupt'd at dur beat
I also notice that there is blanks
on a Reg after using diff kinds
Repdcers & then using original
where there was no blanks
before - This makes me think
that the Repdr starting with a
slight knock or hit on dust or wax
chip records the jump or
a very deep wobble stands it
& the jump is recorded &
keeps getting worse -
43 breaks harder & flabby sounds
than Reg white or through both
have some loudness & harsh
the quality is considerable diff in favor of Reg

Aug 24 1903 —
Piano Tenft [illegible]

Experiments with all the [illegible] and
Endeavt Reg w 43 lipo with
Hatt Chamber Temp. 127 Fahr -

44 R - blind - dont g guess - part not
blind so poor -

37 R - Scratches dont jump out
broked deep -

32 R = Scratches - dont jump out
good quality - broked fairly
deep -

34 R - jumped out little, scratches

[illegible] R — jumped out scratches

39 R — jumped - some scratch

Aug 24 1953

45 R - Jumped a little scratches
some quite good -

56 R Dont scratch much jumps
out quite poor -

40 R - Dont scratch much jumped
out badly.

58 R - Scratchy -

56 R - Very little scratch,
best after lot so far -
Not so good as 43 Cold -

Really four cracks
but quite scratch
57 R. Cracked very deep.

50 R all chipped out along
whole of the tracking -

Aug 24 1903

No scratch quality fine -

30X — but jumped out w a out
tracked deep ruff

15 R — sanatary

No scratch, tracked deep
25 X — but jumped out, swell fine -

43 + Reg white are
best — Reg the best
for all round —

Aug 24 1903

6' 9" 40/100 ball as in front book –

70 R Louder than White, overface Rough in cut, no chip – lunked family deep jumps out on reverse notes wont stand. any deeper twisting, sometimes very little better than White, squeak in high notes.

69 R Scratches more than Reg white good quad – Loud – very dirty Cracker squeak in high notes Rough cut –

66 R – Continually Chopped out ng

73 R – Better than White, best yet

Aug 24 1903

68R – Jumped out, dont scratch much, rough surface – Loud –

74R – Smooth Cut, scratches very little; not so good as 73 – Jumps out & now retake & crack deeper – 2nd time cracked very deep scratch not very much, no chip, no jump out except in a part of one single note. Can crack deeper on this than Regular, probably 73R is still better, quick from Loud – notice when cracking deeper, well not so great as more work has to be done

Aug 24 1953

106R ng- dirty- poor prospect

105 R Can track deep - bad cylinder - not bad - poor prospect.

103 R ng- dirty - " " "

98R Chips out ng -

104R Shows signs of being good - but is dirty - Can track deep
Make clean out - & very slightly -

97R Shows signs of being good
blow holes dirty - make clean
one Can track deep -

107R fair can track deep but
obstructed bad -

101R Abnormal as 104 - 104 97
107 & 101 have peculiarity that high note
not double as base is good - but on whole
not satisfactory - at right track -

Aug 24 1903

89 R Rough jumps out ng —

93 R Scratches jumps out ng

88 R Scratches " ng

92 R Scratches - Cambrioles deep Cyst/Gd

87 R all jumps out ng

91 R Scratches bad chipped

96 R shows a little signs — Scratches — slightly chip

90 — Scratches - shows some signs Cambrioles deep not bad —

80 — Cryptolgd

Aug 24 1903

Possible causes of amplification of certain notes 9 12 14 15 16 17 21 32 Etc

1st = Funnel in tune with the note.

2nd Diaphm in tone with the note

3rd Mandril between centers in tone,

4 = Recorder arm in tone between support + ball resting on wax

Aug 24 1903

5= Recorder arm in tune

6th Elasticity of way, ball on sounding + diaphram arm in tune –

7= Side arm where funnel + Recorder joined w in tune,

8= Dia knife + way + angle on knife in tune

9= Shuttlecock action between sounding board of piano + dia certain notes in tune

Aug 24 1903

10 = Hollow mandrill in tune,

11 = The Piano produces the notes stronger

12 = Window glass in tone —

13 — Tone of the Building

14 Tone or musical note recorded by turning off machines —

Aug 24 1903

15 = Trevellyn rocker vibration between
ball & knife & twist in socket —

16 = friction band in socket where recorder
goes in in tone

17 = The shaft in Centers in Connector
on arm where Reed & funnel
goes in in tone —

18 = air chamber at diaphram in
tone

19 = Arm (glass) on Recorder in tone

Aug 24 1903

20 Glass arm in tone longitudinally by elastically of shellac —

21 = Rubber ring in tone,

22, Friction bite of cylinder on mandrill in tone, this caused by given by ball

23 - Depth - or dia wax record has tone —

24 - Rubber connector has tone,

25 = 5" funnel is all right but no swells — very loud — why is this —

Aug 24 1903

26 - Belt in tune, or friction of belt in tune -

27 All our Reg Cylinders are super this Unknown recorder out adjustment - this may be something on our single recorder

28 Friction note of arm on straight edge -

29 - Knife on recorder not dead right angles to mandrill - or knife this shows on French Rec Recorder which is perfect B flat tone,

30

31 On wallers side vibration of whole recorder in Socket,

aug 24 1903

32 – As thread is a spiral. the diagram & knife must be given a circle turning when it cut a vibration, when steady cut it as head time kept when reciprocated it tends to be released – The angle should perhaps be same as thread to stop it + not right angles to mandril –

33 – Dia vibratio only on a section –

34 – Frenchman cracks frictional mechanism on tone. gives sideways movement –

35 = angled knife tends to make a note always – when dia is in accord with a lower tone multiple it gives powerful vibration – thus in conjunction with angle tendency produces the squeak – thus in so on French, as 5th B flat is powerful while tone is 15 or 3rd B flat

aug 24 1903

36 = Chatter tone is high. ~~[illegible]~~ pin lower when Conjunction spot jumps out,

37 - In French - the XIVth piece is Crown & this has a jumping note.

37 - Jump note mandolin Cantoni,

38 = Jump note, Connection between funnel & Recorder

39 - Jump note arm on attract Edge

40 Jump note big ball & wax

aug 24 1903

41 Jumpmatic Recorder in Reg army,

42 – funnels made out of tins & empty matchbox & chatter time got out then no connection. deaf in recorder is,

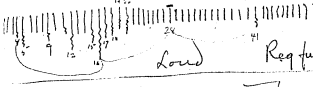
43 – French about 900 – 1000 strong than in Delhi officials 400 – 27 permanently off 50 of chiefs 240 Correspondents in formal figures long

Sept 7. 1903

$3\frac{1}{2}$/1000 paper dia. Internal deep corrugtns. 3/16 from Edge – paper pour found – Regnieu Records

Middle pieces –

No 1



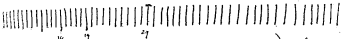
Loud

Reg found 20"

Same dia

Edge Pieces

No 2

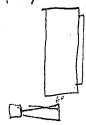


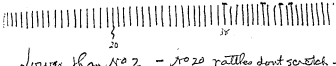
The above is 1/2 the loud of No 1

yet very much louder than many that have awful scrunches in —

No 3 Sept 7 1903

Same as 1.
Except funnel on side of
Edge of piano —



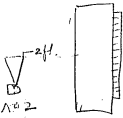


Louder than No 2 — No 20 rattles dont scratch —

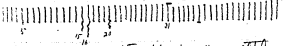
No 4

Same as No 1

This position —



This is louder than No 2
+ that is louder as No 1 —

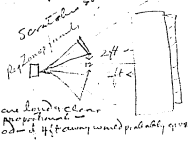


15 16 + 20 rattles

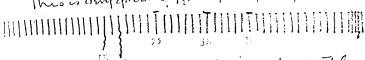
Reed same as 1

No 5 — Sept 7 1903

3.8 glass V like — channel 6½ long — 1½ groove



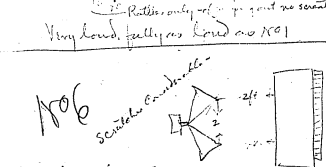
Low notes are loud & clear + all proportional — Thus is very good — if 1½ ft away would probably give good music



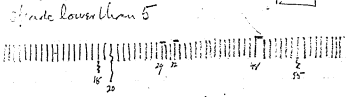
Rattles, only at 20 point no scratch.

Very loud, fully as loud as No 1

No 6



Same channel as 5



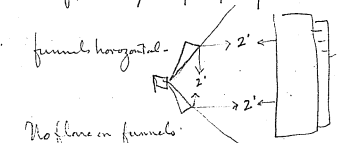
18 to 20 Rattles no scratch.

not pumped on 18 to 20 but we only — there are chatter marks in deep indentations a some chopping — These notes are clearly abnormal

Sept 7 1903

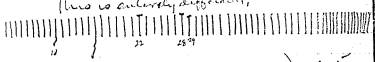
7

Two new funnels one Tin one Zinc
Tin funnel wrapped Tape —
Zinc funnel 27 long 6 opening —



No flare in funnels

Thus is entirely different,



It is only one jumped out is very deep with chatters in indentations,
10 is not jumped but 3/4 way out, only rattles on 10 & 16 no scratch, funny loud not so loud as with Reg funnels

With the Reg .0022 Aluminum disc we get the correct scratch while with 3 1/2/1000 paraffined paper no scratch but only the rattle of jumping out.

Sept 4 1903

This would imply that scratch was due to superior flexibility of all sym-it paper - & that a decid dia is preferable. as then only will the rattler be jumping out to music -

above reproduced with same funnel as I taken with the 2nd notice. 10 has not been altered - but generally there is no difference -

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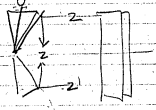
Two funnel flatter angle -

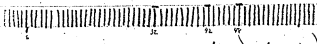
One funnel - 24 X 10½

" 22 X 10 -

8.



pop funnel 9 chanel



All ok - not very loud & tracked deep

don't show much large ones

Sept 7 1903

Duplicate wedged lighter No 9

9

all perfect,

No 10

Dup with long pad on + single keys to get await-

10

Left- 9 ran scale to very sweet + clear

The angle of funnel must change

Column of air in funnel in larger corresponds to any note in a very high one

perhaps there is an angle to a funnel where its air column is such that it will only respond to the highest notes beyond the limits of all ordinary sound-

+ the loudness obtained by two or more such funnels -

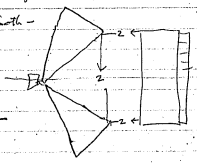
All above is fairly loud — especially had no

There is a why higher up the No 1

probably the tube from funnel to the reed to be shortened to make it higher -

Long tin funnels flat angle — Sept 7 1903

funnels 40 X 15 both —



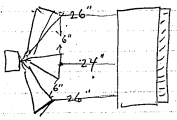
No 11 —

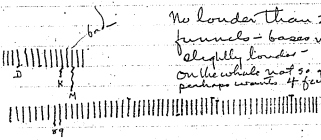
No. — 11 Rg 4

No louder than smaller funnels of No 8 = but measuring from the edge to not so favorably arranged for loudness as the smaller ones — there is a bliz further higher than No 1 ~~See~~ it would seem from this that increase in size dont do much —

Sept 7. 1903

12 = 3 funnels — Brass Tees,
Wallace No 5 funnel.





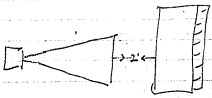
No louder than 2 funnels — bass may be slightly louder — on the whole not so good perhaps because of funnels —

Not jumped out but M. very strong
This is probably something on phono,
or tin of funnel — should be run down

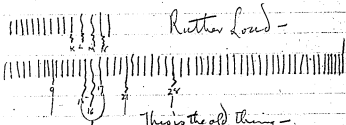
13 = Sept 7 1913

One large funnel very flat angle.

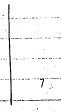
33 long 18 mouth —



Rather Loud —

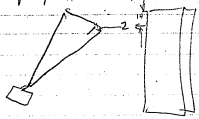


This is the old thing —
so flat angle want it. the 2 funnels or 2 options.

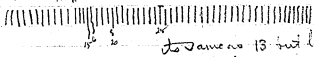


14 – Sept 7 1903

33 X 18 funnel –



Much lower volume

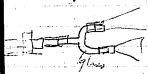


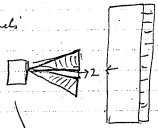
to same no 13 but lower

shows 2 funnels more bright –

15

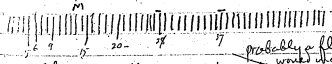
No 5 funnels 2 funnels





Loud

This is very good



probably a flame would shower sometimes or another [illegible] [illegible] cons

shows smutty in 2 funnels –

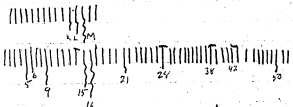
It's the loudest with least disturbance

hour hand — nothing jumped out M is strong

also, 15 had not jumped –

Sept 7 1903

16 — Same as 15 but instead of glass Y use soft red rubber ⅄ —



These jump notes are louder than with glass T hence glass T beat, the difference is very considerable —

There is evidently something about angles of the Y's much in favor of glass Y — It probably has a relation with the Z family

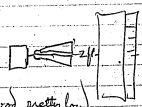
Sept 7-1903

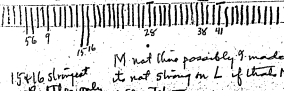
17 = We now put Cock glass ⋃ same as 15 + add some lead weight to Reminder to see if this a Recorder tone between Ball + Support – that causes M – + 15@16

Its not the weight

18 = We put on two small funnels Cut from Reg Zonophone funnels of paper The glass ⋃ used I

the funnel 6½ X 15
" " 6 X 14 –



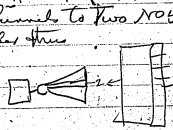


M not there possibly if made musical
15+16 strong not it not strong in L if think M –
Rattle only no sound

Sept 7 1903

18 Continued) Changing + even shaking
funnels doesn't change much except
L is weaker —
15 16 are not jumped out waves are
longer than old Equals not dumpy
but they are chipped out which is
probably cause of rattle,
also a friction ripple waves in bottom
of big waves — probably proper thing

We are making some music with
auto on 18 after practically no
swell at all horribly uneven — no jump out
We track lighter music is better, no
jump but chipper
We track still lighter music more
Even yet no jump out but close to
it but swell is very poor — wheezer rattle
/ plenty - Even with old Reppler - quite as pretty dia
no chattering
We change the funnels to two No 5 —
Im Wallen Numbers thus



Try music —

Music about same rattles, whiny + very little swell. Loud - its (wicked) higher + scarcely jumps out, We now cut funnels ~~off~~ 3 ft away —

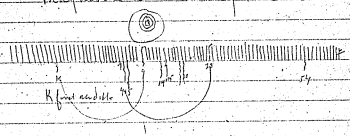
Sept 8th 1903 —

Changed the paraffined paper 3 1/2/1000 for Reg 2/1000 Cor Aluminum —
The Music is now good but very little swell + Base is poor, middle loud —
Taken with same funnels as 18 —
We now change to 2 Xylophone funnels — + try music — not so good as No 5 =

4 - 12 - 28 - 40 - 52

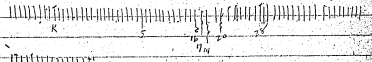
Sept 12 1903

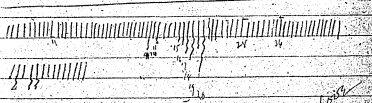
Magnesium Arc on Reg Rec 002


K first ambiguity

Evidently 3 inharmonic lines

Magnesium Rep little rung
but impaged - had crack
in center —

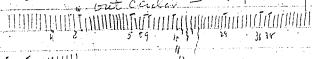




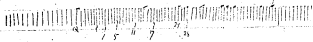
002 Magnesium
Cracked
Loaded
Lost 20 lbs

Magnesium hanger ring

out Carbon —

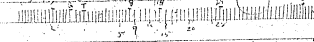


alumnum



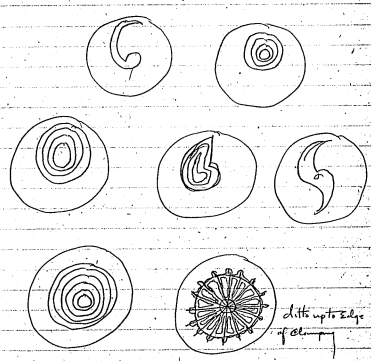
Obtaining Paper 008 dia.

Straight Cracks



paper keeps changing output until above is good on scale — none of (bad notes about) looks and (notes being simply noted or charged) Sombs, possibly Rubber that dia

Diagrams Sept 14 1903



Used paper, Magnesium, Aluminum, Lead, Tin, Celluloid

C		C		C¹		C²		C³		C⁴		C⁵	
C	33	48 C	66	77 C	132	88 C	264	D C	528	L C	1056	B C	2112
D	37	46 D	74	85 D	148	23 D	297	11 D	594	N D	1188	B D	2376
E	41	44 E	82	93 E	165	21 E	330	9 E	660	L E	1320	E	2640
F	44	43 F	88	32 F	176	20 F	352	8 F	704	K F	1408	F	2816
G	49	41 G	99	30 G	198	18 G	396	7 G	792	I G	1584	G	3168
A	55	40 A	110	28 A	220	16 A	440	6 A	880	G A	1760	A	3520
B	61	38 B	123	26 B	247	14 B	495	5 B	990	E B	1980	B	3960

Vibration rate

C	99.8	C	50	C	25	C	12.4	C	6.2	C	3.118
D	90	D	45	D	22.6	D	11.3	D	5.6	D	2.82
E	80	E	40	E	20	E	10	E	5	E	2.50
F	76	F	38	F	19	F	9.5	F	4.77	F	2.38
G	67	G	34	G	17	G	8.5	G	4.24	G	2.12
A	61	A	31	A	15	A	7.6	A	3.82	A	1.91
B	54	B	27	B	13.5	B	6.8	B	3.4	B	1.69

C	1.58				
D	1.41				
E	1.25				
F	1.19				
G	1.06				
A	0.955				
B	0.848				

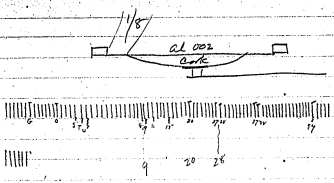
Closed tube rate

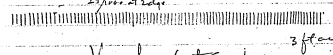
Brg Dia ⅝ 1½"

first Carlwheel design —

Cork

perfect test low — bearing
high rules fine —



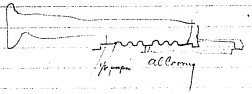


3 ft cover

Very low-but even —
must be made thinner

Base high even

Sept 20 1903 —



Te

Sept 20 1903

Trial of Rosin Cylinders

101 – Little roughness bottom, no jump – no chip – Big ball cuts in too much – with present weights – scratches more than Reg – not loud –

134 – Crystalized – but same characteristics as 101 –

135 – Same as 134 – ball dont sink in so much as 134 – track little brighter – its harder + with same adjustment as 134 – tracks little lighter – on verge of jumping out, track makes longer line Reg – white, thus to Cause wear of 101 + 134 as well – Method

Sept 20 1903

124 – Matted – Big Ball dont go in
scarcely any – tracking light
faltering a hender wax & guess
jumped out waves marks
on Record nearly as fine as
Reg –

129 – Jumped out – tracks lighter,
waves marks as fine as Reg
Big Ball dont mark it –

114 – Turning off machine turns
it rough outward – Big ball
ok – tracks light – jumps out

97 – Record smooth groove –
jumps out turns very rough
on turning Mac – Big ball
ok – waves marks as good
as Reg – Matted –

Sept 20 1903

123 – Not good Tens –

122 – Ruff surface – Tracks light up

121 Turns off rough – Waves coarser than Reg – jumps –

132 – Waves not so smooth as Reg jumps out – Turns Ruff –

110 Turns rough grooves smooth as Reg – jumps out –

133 – grooves not so smooth as Reg – not jumped as fast ~~Entered Sleeper~~ –

125 – grooves rougher than Reg – jumps – turns rough –

130 – grooves Rougher than Reg Crabbed – very little jump Big Ball goes in a little – turns ruff –

Sept 20 1903

127 - Rougher than Reg - jumps
turns poor - no holder at
tracks higher -

73 - Groove as smooth as Reg
very little jump ball shows
no dig in - This Record looks
ok Scratches little more
than Reg on Phono.

2 - Wave marks along - ball on
patches - at tracks deep
only little jump - Record
looks good, scratches on Phono
not same as Reg -

115 = Big ball ok - Tracks very
deep - Rougher wave surface
than Reg No chip,
Something wrong at 9 guess
scratches little more than Reg on Phono

9 - Groove Very rough - Chippy

Sept 20-1903

41 ~~[illegible]~~ — Big ball ok -
May be something in it

126 — Rough groove jumped out,
bad turned surface I

104 or 107 or 109 — Rough - jumps
Good —

90 — Rough - jumps little ~~[illegible]~~

57? — Two hard tracks shallow
all jumped out

34 —— ditto —

101? had 101 before — Rough - jumps —

98 — Chipsout Ug —

Sept 20 1903

15 ? – Worst chipping record 9
Even seen –

32 – Horrible Chippy Rg

49 ? – Rough groove, jumps –
Scratches only little more than Reg

54 = Fair - rougher surface than
Reg –

39 – Horribly Chipped –

75 FF – May be something in it.
Scratches more than Reg

17 Chipped

14 "

50 – Horribly Chipped yet big
Ball good in ? –

59 – Horrible chippy –

Sept 20 1903

68 – Chippy –

66 – Horribly chippy –

56 – May be something in it
Crackles a little from dust or
blows holes in scrapping at same no Reg
Generally Lean

105 = Fair – sometimes shade more
than Reg – Lean –

58 – Horribly Chippy –

70 – Chips slightly –

29 – too hard –

46 too hard

27 Chips too hard –

35 Chips – "

33 " "

53 – Jumpy – rather hard good enough
sometimes shade more than
Reg – Crackles

Sept 20 1903

30 - a little too hard -

26 - Hornsby chipped

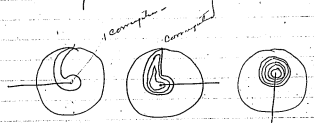
{ 111 - May be something in it
Too scratchy on Replay -
116 too hard -
108 Something in it -
43 Little too hard

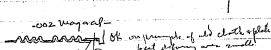
128 - no -

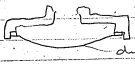
Tried many more of Roosevelt's records
not too hard for present reader -

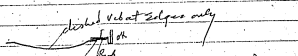
Sept 22 - 1903 -

Diaphragm Tried



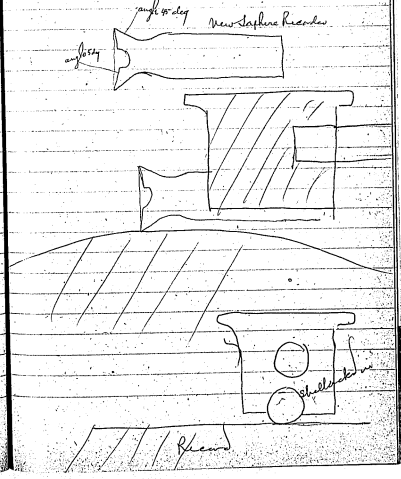




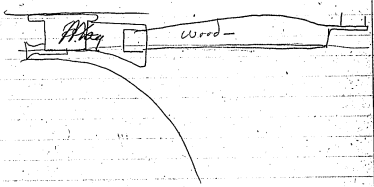


also put on Reader -
don't follow big waves but
also [illegible]

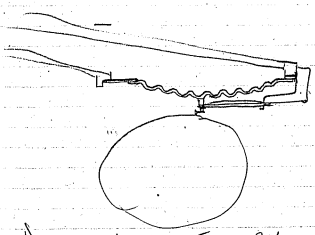
Sept 22 1902


angle 15 deg
New Saphire Breaker
angle 25 deg
Shell Breaker
Breaker

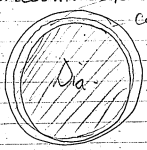
Sept 22 1903



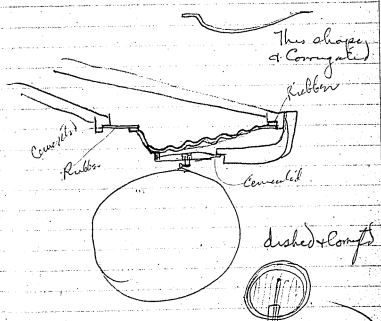
Sept 29 1903 —



Diapm put in eccentric Rub.
Cancelled

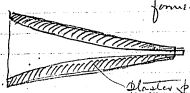


Sept 29 1903



Via mitted vibrating as a whole around 2 edges as like a Reed - Cemented to Rubber at one side + to rubber at other. This gives bigger amplitude on one side more light necessary hence Knife has to be placed to close leverage + not jump out

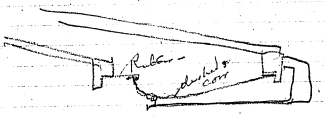
Sept 29 1903 TCE

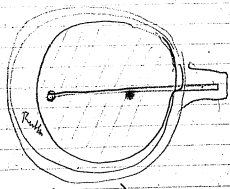


We are making a funnel with a curve of a large circle. it will be 38 inches long & should ~~produce~~ have a tone which should make an inharmonic disturbance in recording of notes 21 33 & 45 of which 21 will be least inharmonic 33 the most inharmonic & loudest & 45 not inharmonic but loud — with the 19 funnel No 9 21 & 33 were the disturbing notes on our piano having doubled the length with a curve of part of a circle & double the dia we should lower these notes one octave, should this be found to be the case then we can increase the length to say 9 or 10 feet by using a portion

Sept 29 1903 T.A.E.

of the arc of a larger circle & lower the funnel tone so the inharmonics will be so low than in most all pieces played they will seldom be used — we will be relieved of this horrible nuisance





Dia looks like a Read —
Lifelike with hand but w/ Rubber

Oct 7 1903

Chilling Crystalizable Torquine Salt
Etc in Copper mould immersed Cold
water to get amorph –
Punaton ng
Phenacetin – fours – harder than Reg
Paparoin – clear glass hard bottle
like Candy –
Diphenylamine Still Crystalizes – very hard
might do for a mix –
Cinchonidia Sulfate – decomposes –
Boroglycerine – boils up watery – chills
soft ng –
Diphenylamine Sulfate M.P. low – chills
fair on chill surface OK – brittle, hard
Ferr Cyanide – wants pressure to chill
to get smooth good surface –
Hexachlorobenzol rather high M.P. – 90°C
clear – fair signs of chill – comes
loose from mould – very thin outer
surface chilled – hard, cuts to powder
might do for mixing in a chilled mixture
acts as hardener –
Resorcinol, Resolve M.P. – comes loose
from mould split – semi amorp – very
brittle – mixer –

Oct 7 1903 –

Chrysolin salicylic – MP family low
Cinchonida – quite high MP – Crystallin
Acenaphtholeide – MP low – Crystalline –
Anthracene – Very Crystalline –
Chrysarobin – MP family high – chars –
Semi amorph – Carbinol's Lake Chrysarobin
Much harder OK for mix
Cinchonidine – MP family low – Semi
amorph – dirt stick – Second-ly hard – mix
Anthracinone high MP. Sublime
Chars semi amorp – Second-ly hard –
Antifebrin – MP little high – amorp
surface – very hard – semi bitter – good
for mix –
Acetamide – MP family low –
seems to deliquesce – Trans. not hard
deliquesce – might do for some
mixes – Chars well – semi amorp
on outside –
Acetolphenetidin Crude MP family high –
Crystalline –
Orthoamidophenol – MP family high
amorp on surface terrible bitter
Sublime – Mix

Parraamidspheral MP high clear
sublime some – amorp nearly all this
Very hard – mix –

	length S wave	frequency
100 Vib sec	134	33
150 "	89	22
200	67	17
256	52	13
300	45	12
350	39	9
400	33	8
512	26	7

No. of inches in 1120 ft

Vel of S at 70 Fahr = 13.440 inches =

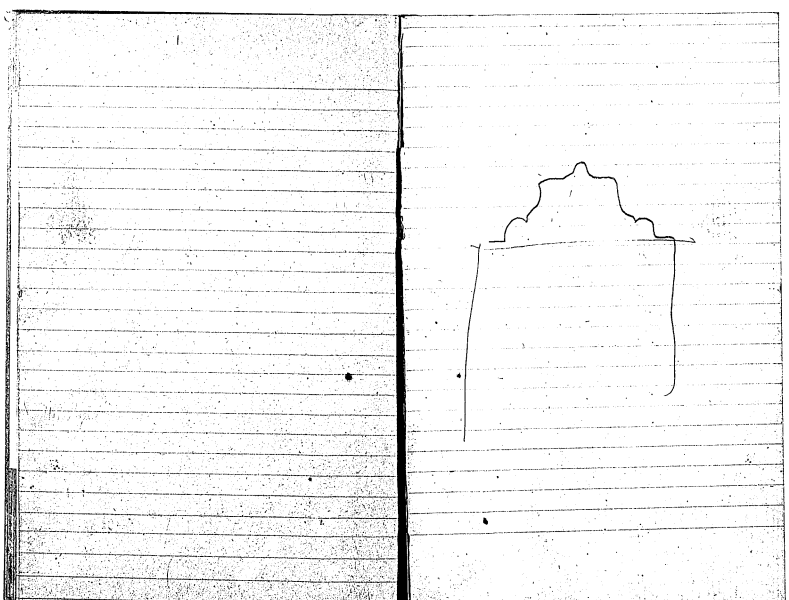
4 | 448

12 | 112 (9.3
108
4

30 | 13440 (448
120
144
120
24

56 4 | 56
14

240 | 13440
1200
1440

2000 | 13440 (6.7
1200
1440

4 | 6.7
1.7